

CLAIMS

1. An imaging machine comprising an imaging unit and a data
5 processing unit, the imaging unit comprising at least one light source and a
plurality of image collectors, each image collector comprising a
photosensitive element, a plurality of alternatively stacked layers of a
dynode material and an electrical insulator mounted on a substrate, each
10 stacked layer having one or more apertures which aligns with apertures in
adjacent layers to form one or more channels extending through the
stacked layers and closed at one end by the substrate, an anode provided
at the closed end of the channels, and a signal connector connected to the
anode and to the data processing unit, the data processing unit comprising
15 at least one processor for generating image data based upon signals
received from the plurality of image collectors.

2. An imaging machine as claimed in claim 1, wherein each
image collector channel has a respective anode.

20 3. An imaging machine as claimed in either of claims 1 or 2,
wherein each dynode layer is made of an electrically conductive material
and at least a region of the surfaces of each dynode layer exposed in each
channel is coated in a secondary-electron emissive material.

25 4. An imaging machine as claimed in claim 3, wherein the
electrically-conductive dynode material is non-metallic.

5. An imaging machine as claimed in any one of the preceding
claims, wherein the walls of the apertures in each dynode layer are tapered
30 towards the anode.

6. An imaging machine as claimed in any one of the preceding

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claims further comprising a light-transparent support for items to be imaged and wherein the plurality of image collectors are mounted within an evacuated chamber with the wall of the chamber facing the open ends of the image collector channels being in light communication with said light-transparent support.

7. An imaging machine as claimed in claim 6, wherein the at least one light source is positioned adjacent an edge of the light-transparent support, and the light-transparent support has internal facets to distribute light from the at least one light source to the surface of the transparent support remote from the plurality of image collectors.

8. An imaging machine as claimed in claim 6, wherein the substrate and the stacked layers of dynode material and electrical insulator of the image collectors include one or more through holes for permitting the passage of light and wherein the at least one light source is located adjacent the surface of the substrate facing away from the open ends of the image collector channels whereby the one or more through holes are adapted to transport light from the at least one light source to the light-transparent support.

9. An imaging machine as claimed in claim 8, wherein the wall of the evacuated chamber facing the open ends of the image collector channels is said light-transparent support.

10. An imaging machine as claimed in any one of the preceding claims having an image resolution of at least 5 line pairs per mm.

11. An imaging machine as claimed in any one of the preceding claims, wherein the surface area of the plurality of image collectors corresponds to the imaging area of the imaging unit.

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12. An imaging machine as claimed in any one of the preceding claims, wherein the data processing unit generates image data based only upon signals received from a selected portion of the plurality of image collectors.

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13. An imaging machine as claimed in any one of the preceding claims further comprising a printing unit in communication with the data processing unit for printing an image based on image data generated by the data processing unit.

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14. An imaging machine as claimed in claim 13, wherein the image data generated by the data processing unit comprises a plurality of image strip data and the printing unit prints an image based upon the plurality of image strip data.

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15. A photocopier machine comprising an imaging unit, a data processing unit and a printing unit in communication with the digital processing unit, the imaging unit comprising at least one light source, a light-transparent support and a plurality of image collectors, each image collector comprising a photosensitive element, a plurality of alternatively stacked layers of a dynode material and an electrical insulator mounted on a substrate, each stacked layer having one or more apertures which aligns with apertures in adjacent layers to form one or more channels extending through the stacked layers and closed at one end by the substrate, an anode provided at the closed end of the channels, and a signal connector connected to the anode and to the data processing unit, the data processing unit comprising at least one processor for generating image data based upon signals received from the plurality of image collectors determining the image to be printed by the printing unit.

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